Name: Date:

Polynomial Factoring solution (version 696)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 8x + 28 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-8) \pm \sqrt{(-8)^2 - 4(1)(28)}}{2(1)}$$

$$x = \frac{-(-8) \pm \sqrt{64 - 112}}{2(1)}$$

$$x = \frac{8 \pm \sqrt{-48}}{2}$$

$$x = \frac{8 \pm \sqrt{-16 \cdot 3}}{2}$$

$$x = \frac{8 \pm 4\sqrt{3}\,i}{2}$$

$$x = 4 \pm 2\sqrt{3}\,i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $3 + 5i$ and $-4 - 7i$ in standard form $(a + bi)$.**

Solution

$$(3 + 5i) \cdot (-4 - 7i)$$

$$-12 - 21i - 20i - 35i^2$$

$$-12 - 21i - 20i + 35$$

$$-12 + 35 - 21i - 20i$$

$$23 - 41i$$

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3. **Write function $f(x) = x^3 + 5x^2 - 12x - 36$ in factored form. I'll give you a hint: one factor is $(x + 2)$.**

Solution

	1	5	-12	-36
-2		-2	-6	36
	1	3	-18	0

$$f(x) = (x + 2)(x^2 + 3x - 18)$$

$$f(x) = (x + 2)(x + 6)(x - 3)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = -(x + 6) \cdot (x + 3) \cdot (x - 1) \cdot (x - 4)^2$$

Sketch a graph of polynomial $y = p(x)$.